STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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Memo To: Hydraulics Project Managers

From: David R. Henderson, P.E.
State Hydraulics Engineer

Subject: Bridge Deck Drains

On October 9, 2001, David Chang presented the guidelines for bridge deck drains for stream crossing in watersheds where buffer rules are in effect. Through subsequent permit reviews, expectations of the regulatory agencies have been clarified. Listed below are the Hydraulics Unit's guidelines and practices for placement of bridge deck drains.

1. Bridges Over Buffer Streams: Bridges within the Randleman Lake, Neuse, Tar-Pamlico river basins shall not have deck drains which discharge directly into the surface water, open channel, or buffer zone (measured 50 feet from the channel banks). This also applies to the bridges in the Catawba River basin where temporary buffer rules are in effect on the Catawba River mainstem below Lake James. Where low cord of the bridge deck is 12 feet or more above the natural ground, the stormwater from the deck drains will be diffused flow into the buffer. Therefore, the deck drains may be discharged directly over the area within the buffer zone. This will be subject to individual review and approval by the regulatory agencies on a project by project basis.

2. Bridges In CAMA Counties: Bridges in the 20 CAMA counties, which require State Stormwater Permits, shall not have deck drains which discharge directly into the surface water. Any direct discharge from deck drains outside the main channel shall also be avoided to the maximum extend practical (MEP), unless advised by the regulatory agencies.

3. Bridges Over Sounds Or Inter-Coastal Waterway: Because the volume of stormwater runoff from the deck drains is minuscule compared with the immense water bodies of the sounds and absence of practical sites to locate effective treatment, bridges over sounds or inter-coastal waterway may be allowed to discharge directly into the waters, unless advised by the regulatory agencies. As most of these bridges facilitate boat passage, the high rise and winds would help diffuse and/or diminish the stormwater from the bridge decks.

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4. Bridges Over Other Waters: For bridges over perennial or tidal streams (not including sounds or inter-coastal waterway) in other areas of the state, consideration should be given to avoid direct discharge into the surface water. Any direct discharge from deck drains outside the surface water and in over bank areas similar to buffers shall be avoided to the MEP, as long as the safety of the traveling public is not compromised (icing & hydroplaning).

5. Bridges At Grade Seperations: Bridges over roadways and/or railroads shall not have deck drains which discharge directly over the travel lanes or side walks.

If a closed drainage system for the bridge deck is needed, its outlet pipe shall be placed as far away from the water as practical. A preformed scour hole is recommended at the outlet to help diffuse and infiltrate the stormwater, unless other BMP devices are used. Closed drainage systems for the pre-stressed girder super structure will have the 4 or 6 inch diameter PVC pipes installed vertically through the deck to a drainage system beneath the deck. Detail drawings are available through the Design Services and the Structure Design Units. Currently we are working with Structure Design staff on the drainage system for cored slab bridges. The 4 inch diameter (or its equivalent) PVC pipes are placed horizontally through the barrier rail to a drainage system that is attached to the edge of the bridge deck. To ensure positive drainage, a minimum of 0.3 % slope is desirable for the drainage systems for both types of super structures. The storm drainage system shall be UVL-proof material.

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